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ABSTRACT

Major social and economic trends in American and California life that will affect California's colleges and universities during the next 15 years are identified. Characteristics of the information-based economy are examined, along with projections concerning the 40 fastest-growing jobs between 1982 and 1995. College and university research has provided the scientific bases for technological advancement and improvements in communications, transportation, and production. Attention is directed to: private funding of higher education, continued economic growth in the United States, the federal deficit, balancing imports and exports, increased conservation of resources, present and projected sources of energy, and demographic and social trends. Social trends in the country include increasingly open lifestyles, less permanent family associations, greater personal anxiety, and a desire for instant gratification. The effects of these trends and demographic changes on postsecondary education include greater vocationalism and corporate involvement, increased emphasis on business and technology, a de-emphasis on the liberal arts and humanities, the relative growth of the public sector, and a larger number of transient students taking part-time programs. (SW)

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The California Postsecondary Education Commission was created by the Legislature and the Governor in 1974 as the successor to the California Coordinating Council for Higher Education in order to coordinate and plan for education in California beyond high school. As a state agency, the Commission is responsible for assuring that the State's resources for postsecondary education are utilized effectively and efficiently; for promoting diversity, innovation, and responsiveness to the needs of students and society; and for advising the Legislature and the Governor on statewide educational policy and funding.

The Commission consists of 15 members. Nine represent the general public, with three each appointed by the Speaker of the Assembly, the Senate Rules Committee, and the Governor. The other six represent the major educational systems of the State.

The Commission holds regular public meetings throughout the year at which it takes action on staff studies and adopts positions on legislative proposals affecting postsecondary education. Further information about the Commission, its meetings, its staff, and its other publications may be obtained from the Commission offices at 1020 Twelfth Street, Sacramento, California 95814; telephone (916) 445-7933.

SOCIAL AND ECONOMIC TRENDS: 1985-2000

The Second in a Series of Background Papers
for the Commission's Long-Range Planning Project,

A PROSPECTUS FOR CALIFORNIA POSTSECONDARY EDUCATION
1985-2000

CALIFORNIA POSTSECONDARY EDUCATION COMMISSION
1020 Twelfth Street, Sacramento, California 95814

Commission Report 84-30

Adopted September 7, 1984

This report is being issued in this format awaiting completion of the other background papers for the Commission's long-range planning project, at which time all of the papers may be issued in one volume.

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INTRODUCTION

Nothing endures but change.
-- Heraclitus (540-490 B.C.)

This paper seeks to identify major social and economic trends in American and California life which will affect California's colleges and universities during the next 15 years. The economic world of the remainder of the 1980s and the decade of the 1990s is likely to be defined by such issues as changes in industrial production and employment, conservation of energy and resources, the control of federal deficits, and the balance of international trade. Important social changes are occurring in the age and ethnic diversity of the population, in individual lifestyles and community organization, and in public attitudes. These changes are likely to have major impacts on postsecondary education, and thus the California Postsecondary Education Commission believes that postsecondary planners and policy makers should be alert to them and to their potential consequences.

This paper is the second prepared by the Commission to provide background for its current reassessment of California's needs for postsecondary education during the remainder of this century, "A Prospectus for California Postsecondary Education: 1985-2000." In this project, the Commission is analyzing likely social, economic, and demographic trends of the next 15 years, the need for postsecondary services, and the educational resources that California will need over this period to ensure continuation and enhancement of its quality of life.

In the first paper for the project, A Review of Statewide Long-Range Planning, the Commission discussed previous planning studies that have been conducted on California postsecondary education since World War II, beginning with The Survey of the Needs of California in Higher Education of 1948 and including the Master Plan for Higher Education in California, 1960-1975, of 1960. Virtually all of those earlier studies were concerned, for the most part, with structural, organizational, and governance issues -- such as the size and location of institutions, their functions and responsibilities, the areas each segment would be prohibited from entering, and the way in which they were managed, governed, and coordinated.

In one sense, the Commission's current "Prospectus" project represents another major effort to plan the future course of postsecondary education in California, but unlike those earlier studies, it does not focus primarily on issues of structure, governance, and differentiation of function. Instead, it concentrates on trends and developments external to postsecondary education with which educational and governmental leaders will have to be concerned in coming years.

Besides this paper on social and economic trends, a later paper, Population and Enrollment Trends: 1985-2000, will describe current and anticipated demographic changes in California's population -- its age and ethnicity distributions, educational attainment, and family income -- that are likely to influence the need for and participation in postsecondary education, both

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at statewide levels and in the several segments. Next, a fourth paper, Financial Support for California Postsecondary Education: 1985-2000, will examine the ability of California's economy to provide the fiscal and material resources necessary to support postsecondary education over the next 15 years. Based on the current paper and that on population and enrollment trends, it will focus on the probable effects of economic, social, and demographic changes on State revenues and on the funds available for education beyond high school. Finally, the Commission plans a fifth paper, Policy Issues for Postsecondary Education: 1985-2000, that will discuss the implications of trends identified in the earlier papers for the purposes, programs, and policies of California's postsecondary institutions. (Further information about these papers and the entire "Prospectus" project can be found in the Commission's plan for the project, A Prospectus for California Postsecondary Education: 1985-2000, available from the Commission as Report 84-6.)

Like these planned papers, this paper does not offer specific predictions on what California's economy and society will be like between 1985 and the year 2000. Instead, it presents and evaluates probable economic and social developments over the remainder of this century. It does not endorse the bulk of futurist writing but relies heavily on the best forecasts of respected future-oriented thinkers. As Selwyn Enzer of the University of Southern California has said about "futures research" (1983, p. 75):

> The fundamental assumption of futures research is that society is not predestined or otherwise constrained to a particular long-run end state. With such an assumption, soothsaying is simply not possible. The future is likely to be significantly different from the present in many important ways. Futures research is concerned with understanding long-term social conditions, their prospects for change, and the direct and indirect consequences of these changes -- where society is heading and the degree to which this destination can be altered.

In that spirit, the Commission invites not only attention to the five major economic and social trends discussed on the following pages but also reaction to this discussion, with the hope that subsequent papers from the "Prospectus" project will be based on the most comprehensive comments and wide-ranging thought available.

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TOWARD AN INFORMATION-BASED ECONOMY

In 1967, Herman Kahn observed (p. 86):

> If the middle third of the twentieth century is known as the nuclear era, and if past times have been known as the age of steam, iron, power, or the automobile, then the next thirty-five years may well be known as the age of electronics, computers, automation, cybernation, data processing, or some related idea.

Since 1967, a number of other social thinkers and writers have agreed with his observation. Many of them now believe that the United States -- and California in particular -- is passing into a third great economic period. They see the first as having been dominated by agriculture, the second by mass-production industry, and the third by information and services. Although agriculture remains California's major business, and although its wealth will continue to depend on such traditional industries as heavy manufacturing, transportation, aerospace, and oil, the shift of its economy toward the service industries -- and especially those involving information services -- is well underway and growing.

The "industrial" era of the past century was based on a combination of several economic factors, among them cheap energy and raw materials, abundant capital, low interest rates, inexpensive and plentiful labor, and the mass production of uniform or standardized commodities. Some of the manifestations of this era included the assembly line, interchangeable parts, economies of scale, and planned obsolescence. Industrial workers, as well as those in agriculture, did not require a great deal of education; growth in employment and productivity generally occurred in the largest corporations; and capital tended to concentrate in fewer and fewer hands, until government, spurred by the scandals surrounding monopolies and the suffering occasioned by the Great Depression, became an active force in the nation's economic life by regulating corporations and redistributing income enough to permit the circulation of capital and the continuation of economic growth.

According to Paul Hawken (1983), the industrial era ended and the new information-based economy began in 1973-74, with the Arab oil embargo and the quadrupling of oil prices. Obviously, any such precise date could easily be challenged, but because industrialism is based principally on the availability of cheap energy, Hawken identifies 1973-74 as the pivotal year, because energy became far more expensive afterwards. Table 1 below, adapted from Hawken's The Next Economy, shows how the cost of oil has changed over the course of the twentieth century. Because oil remains America's principal energy source -- accounting for 43.5 percent of the total consumed in 1981 -- this price jump sent shockwaves throughout the national and California economies -- and indeed throughout the industrialized world. Mass-production economies, epitomized by the automobile industry, have used planned obsolescence as their guiding principle. With energy and materials inexpensive and easily obtainable, it was more prudent to buy new products, use them for a short time, and then buy new ones rather than repair them. However, when the cost of products rose to the point that they were much more expensive to

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TABLE 1 Weekly Wages and the Cost of Oil in Terms of Dollar Cost and Hours Worked, 1900 to 1982

Year	Weekly Wages (current)	Weekly Wages (constant)	Dollar Cost/ Barrel of Oil (constant)	Number of Hours Worked to Buy One Barrel of Oil
1900	8	32	$ 3.80	4.8
1910	11	41	2.55	2.3
1920	26	57	4.42	3.1
1930	27	54	2.62	1.9
1940	25	60	2.59	1.7
1950	58	81	3.23	1.6
1960	93	106	3.45	1.3
1970	148	128	1.79	0.6
1971	158	131	1.91	0.6
1972	168	134	1.85	0.6
1973	179	135	1.95	0.6
1974	192	130	7.92	2.4
1975	208	129	7.14	2.2
1976	223	131	6.77	2.1
1977	238	131	6.85	2.1
1978	256	131	6.51	2.0
1979	277	127	7.82	2.5
1980	302	120	12.75	4.3
1981	316	116	12.47	4.3
1982 (prelim.)	330	113	10.94	3.9

Source: Hawken, 1983, p. 87.

purchase than to repair and maintain, the premium shifted to quality, efficiency, and durability. With the price of oil skyrocketing, it made much more sense to consumers to purchase cars that got 25 miles to the gallon than to retain those that got only 12. This was the fact that the Japanese and the Europeans quickly realized but that American manufacturers ignored to their great economic detriment and, in the case of the Chrysler Corporation, near demise. It might also be added that Congress was partially to blame for this problem, since it artificially held prices down until the early 1980s.

CHARACTERISTICS OF THE INFORMATION-BASED ECONOMY

What has been evolving for about a decade is an extensive and ultimately even revolutionary structural change in California's economy and employment

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toward a "post-industrial" society. In recent years, various names have been coined for this change, such as the "high-tech revolution" and the "age of automation;" but the term that most economists seem to be settling on now to exemplify the change is "information" -- and for a good reason. All physical objects are a combination of mass and information, but they differ in their proportions of this combination. For example, because of its shape, a coil of copper wire contains more information than an ingot of the same amount of copper. A shirt has more information than the same amount of unspun cotton. A computer chip has many times more information than a blob of silicon. And the emphasis on mass that characterized the industrial age is now shifting toward information. Bulk is giving way to miniaturization in everything from automobiles and computers to radios, television sets, and other appliances. Even where the absolute size of objects is not being reduced, more is being done within the same space. Hawken describes the effect of this change as follows (p. 78):

> Whereas mechanical tools and machines represented the extension of our muscle, today's microelectronics represent the extension of our mind into matter, and their primary economic value will be to reduce the amount of matter consumed. Because we are making mass more intelligent and informed, we will require less to maintain a high standard of living. Because we require less physical stuff, many people whose job it was to make that stuff will be thrown out of work. Millions of people are losing their jobs as the mass economy declines while millions of new jobs are being created as the informative economy emerges. Wealth is being created in the face of suffering, growth alongside economic ruin.

This change has extensive implications for business and social investment. As Beverly Cronin has noted (1983, p. 258), "America's economic base is shifting away from the traditional capital-intensive industries to the rapidly emerging knowledge-intensive industries. The 'sunset' industries such as steel, paper, and automobiles require heavy investments in machinery. The 'sunrise' industries such as communications, computers, microelectronics, and other information technologies require instead a greater investment in people."

Thus economists such as Hawken and Robert Reich, as well as such social commentators as John Naisbett and Alvin Toffler, argue that America's recent economic recession was only in part a cyclical adjustment: Its major cause was the restructuring of the economy from mass-production industries to smaller, more flexible, innovative, and information-intensive companies. Most new jobs are being created in small firms rather than in the Fortune 500, and primarily in the service sector rather than in the goods-producing sector (Botkin, Dimancescu, and Stata, 1982, p. 17-30). As the Congressional Budget Office notes (1984b, p. 11),

> The most obvious change in the structure of the economy . . . is in the proportions of final demand devoted to goods and services. In 1950, the goods/services ratio stood at 1.8 to 1. By 1980 it had fallen to half that, or 0.9 to 1.

In 1950, production and construction work accounted for one out of every four jobs. As of 1983, they comprised only one in eight. And Bob Kuttner

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(1983, p. 60) points out that while the manufacturing sector of the economy added four million jobs in the decade between 1958 and 1968, it added only one million in the subsequent decade and lost three million between 1978 and 1982. Part of this decline, of course, was due to the 1979-1982 recession, but not all of it can be explained by the downturn in the business cycle.

One important side effect of the restructuring of the economy could be a shift in the wage structure. Several observers have noted that the millions of jobs gained and lost in the shift from a mass-production economy to an information-based economy are not of equal financial value to those who hold them, in that those lost are often well-paying, compared to those gained. Kuttner observes (p. 61), "There is nothing intrinsic in assembling cars, mining coal, or pouring molten steel that requires high wages. These jobs do pay well mainly because of the efforts of strong unions." And labor-union membership is clearly declining as a percentage of the national labor force. In 1950, the approximately 15-million union members represented 31.5 percent of the national nonagricultural labor force. By 1970, their number had grown to 20.8 million, but their percentage had dropped to 27.5 percent. By 1980, their percentage dropped further -- to 25.2 percent by one count and 23.6 by another -- and was the lowest in at least three decades (Bureau of the Census, 1982, p. 408f). There is no reason to think that this trend is temporary, since most new jobs are being created both in smaller firms and in the service sector --and such companies are usually the least likely to be unionized or to pay high wages for any reason.

INCREASES IN SERVICE JOBS AND OCCUPATIONS

Current job openings and employment projections through 1995 developed by the U.S. Bureau of Labor Statistics illustrate the trend toward service-related employment and, in particular, jobs devoted in large part to the processing of information. In 1982, the Bureau ranked the number of actual job openings in 1980 by category. The top 15, in terms of the number of people involved, were as follows (Kuttner, 1983, p. 62):

Retail sales clerks	757,750
Managers and administrators (not elsewhere classified)	711,793
Cashiers	617,793
Secretaries (not elsewhere classified)	599,216
Waiters and waitresses	465,628
Cooks (except private household)	437,341
Stockhandlers	358,393
Janitors and sextons	333,309
Bookkeepers	304,789
Miscellaneous clerical workers	299,940
Nursing aids and orderlies	284,332
Child-care workers, private household	277,525
Building-interior cleaners	259,528
Typists	250,276
Truck drivers	245,377
TOTAL	6,202,990

Information processing is a primary task in at least five of these jobs -- managers and administrators, secretaries, bookkeepers, miscellaneous clerical workers, and typists; and the processing of information on financial transactions is a major part of two others -- retail sales clerks, and cashiers. Virtually all the rest are engaged in one or another service industry, whether health and family care or building maintenance. Out of all 15, only stockhandlers and truck drivers are closely related to manufacturing and distribution.

Job openings, of course, are not entirely indicative of actual jobs held, among other reasons because turnover is always higher in low-paying than high-paying jobs. But the Bureau's projections of new jobs between 1982 and 1995 reveal similar patterns. Over these 13 years, the Bureau estimates that 21.2 million new jobs will be created nationally. The 40 fastest-growing categories, which may account for nearly 60 percent of the total, are listed in Table 2 on the next page. As can be seen, the Bureau expects the fastest growth among building custodians, cashiers, secretaries, general office clerks, and sales clerks. Also in the top ten are nurses and teachers, and accountants are in twelfth place.

These projections of new jobs over the next decade point up two facts about the trend toward an information-based economy that have been subject to considerable misconception in recent years. Contrary to some predictions, (1) growth in the economy will <u>not</u> occur only in "high technology" industries; and (2) the new jobs will <u>not</u> all be highly skilled, requiring extensive education. Because these facts have major implications for postsecondary planning, they warrant special discussion here.

"High Tech" is Only One Part of the Information-Based Economy

There is no question but that high-tech industries are currently attracting vast attention both nationally and in California. Many states are competing for such industries as they never have for any others in the past. From the media attention given them, it might seem that computers, lasers, robotics, other electronic components, and biotechnology are not only the economic wave of the future, they are also the answer to the economy's employment problems. According to the U.S. Department of Labor, however, this impression regarding employment is not accurate. Recently, the Department's Bureau of Labor Statistics attempted to define high-technology industries and then to project employment potential in them through 1995. Its definition involved two characteristics: (1) employment of engineers, life and physical scientists, mathematical specialists, engineering and science technicians, or computer specialists at a rate one and one-half times that of the average for all industries, and (2) a level of expenditures for research and development twice the national average.

Based on this definition, the Bureau identified 48 industries, ranging from such obvious ones as those producing "office, computing, and accounting machines" and "guided missiles and space vehicles" to such less obvious ones as those in "wholesale trade: machinery, equipment, and supplies," "tires and inner tubes," and "paints and allied products." In 1972, these industries accounted for 13.1 percent of all wage and salary employment in the United

TABLE 2 Forty Fastest-Growing Jobs Between 1982 and 1995 as Projected by the U.S. Bureau of Labor Statistics

Occupation	Change in Total Employment (in Thousands)	Percent of Total Job Growth	Percent Change
Building Custodians	779	3.0	27.5
Cashiers	744	2.9	47.4
Secretaries	719	2.8	29.5
General Clerks, Office	696	2.7	29.6
Saleclerks	685	2.7	23.5
Nurses, Registered	642	2.5	48.9
Waiters and Waitresses	562	2.2	33.8
Teachers, Kindergarten and Elementary	511	2.0	37.4
Truckdrivers	425	1.7	26.5
Nursing Aides and Orderlies	423	1.7	34.8
Sales Representatives, Technical	386	1.5	29.3
Accountants and Auditors	344	1.3	40.2
Automotive Mechanics	324	1.3	38.3
Supervisors of Blue-Collar Workers	319	1.2	26.6
Kitchen Helpers	305	1.2	35.9
Guards and Doorkeepers	300	1.2	47.3
Food Preparation and Service Workers, Fast Food Restaurants	297	1.2	36.7
Managers, Store	292	1.1	30.1
Carpenters	247	1.0	28.6
Electrical and Electronic Technicians	222	.9	60.7
Licensed Practical Nurses	220	.9	37.1
Computer Systems Analysts	217	.8	85.3
Electrical Engineers	209	.8	65.3
Computer Programmers	205	.8	76.9
Maintenance Repairers, General Utility	193	.8	27.8
Helpers, Trades	190	.7	31.2
Receptionists	189	.7	48.8
Electricians	173	.7	31.8
Physicians	163	.7	34.0
Clerical Supervisors	162	.6	34.6
Computer Operators	160	.6	75.8
Sales Representatives, Nontechnical	160	.6	27.4
Lawyers	159	.6	34.3
Stock Clerks, Stockroom and Warehouse	156	.6	18.8
Typists	155	.6	15.7
Delivery and Route Workers	153	.6	19.2
Bookkeepers, Hand	152	.6	15.9
Cooks, Restaurants	149	.6	42.3
Bank Tellers	142	.6	30.0
Cooks, Short Order, Specialty & Fast Food	141	.6	32.2

Note: Includes only detailed occupations with 1982 employment of 25,000 or more. Data for 1995 are based on moderate-trend projections.

Source: Bureau of Labor Statistics, 1983, p. 45.

States. By 1995, according to the Bureau's moderate-level projections, they will account for only 14.1 percent.

Similarly, in the list of 40 jobs in Table 2 that the Bureau expects will grow most rapidly through 1995, the jobs directly linked to "high tech" do not appear until numbers 20 (electrical and electronic technicians), 22 (computer systems analysts), 23 (electrical engineers), and 24 (computer programmers) -- and they account for only 5.4 percent of the total number of new jobs.

In other words, despite the trend toward "high tech," high technology employment is not necessarily the same as employment in industries that specialize in information. The computer certainly emerged from industries which would meet any definition of high technology, but its uses go far beyond that. For example, banks, finance companies, credit unions, and similar corporations are not part of the high tech complex, but it is very clear that their operations would be vastly different today if computers did not exist. The same can be said of private mail services such as Federal Express, Purolator Courier, and Emory, consulting firms, brokerage houses, hotels and motels, credit card companies, the medical profession, and vast areas of government. A recent article in Telecommunications Policy observed that 67 of California's 100 highest revenue-growth firms are corporations in the fields of information services or technology, and it reported that 48 percent of all California workers in 1980 were involved in "creating or manipulating information for their principal job task. Another 3 percent produced or maintained information technology. Job descriptions for these workers range from secretaries to telephone installers to teachers to artists to engineers, and clergy" (Schement, Lievrouw, and Dordick; 1983; p. 70).

Highly Skilled and Educated Workers Are Only Part of the Labor Force

Henry Levin of Stanford has noted (1984) that of the 40 jobs listed in Table 2, only nine are in the "professional and technical" classification that generally require the greatest skills, and these nine account for only 21.1 percent of the new jobs among all 40 categories. He points out that while the percentage share of these jobs in the professional and technical classification is expected to increase by 31.3 percent between 1982 and 1995, compared to a 25.2 percent increase for all occupations, the occupations requiring the most education will still represent only 17.1 percent of the labor force by 1995.

He also notes that (p. 2):

> In considering where the jobs will be and their educational requirements, we must avoid two fallacies that are reflected in popular discussions on the subject. First is the fallacy that equates "high technology" industries with jobs that require high skill levels and advanced education. Second is the fallacy that assumes that the fastest growing job categories in terms of relative growth or percentage growth are also the ones that will provide the most new jobs in the future.

Levin argues that there is no evidence that most jobs within "high tech" industries will require large amounts of education; instead, many employees of these firms will be relatively unskilled assemblers, operatives, and clerical personnel. Moreover, he observes that while such occupations as engineers and computer scientists are projected for substantial growth (48.5 and 84.3 percent, respectively, between 1982 and 1995), the great majority of new jobs will not lie in these areas.

Russell Rumberger, an associate of Levin at Stanford's Institute for Research on Educational Finance and Governance foresees these employment trends leading to a growing dichotomy between a highly educated elite and a much larger mass at the lower end of the socio-economic scale -- the latter being poorly paid, generally unskilled, and with few opportunities for upward mobility. He warns (1981, p. 3) that:

> continued technological development will furtner tend to fragmentize and routinize jobs into lower skilled components. The widespread application of microelectronics, for example, has already reduced the need for mathematical skills among cashiers and clerical workers. Other developments could continue to "deskill" many jobs.

Similarly, Schement, Lievrouw, and Dordick (1983, p. 71) observe:

> The emphasis on productivity in information work splits the information workforce in two. On one side are the highly educated, highly paid creative professionals allowed to work according to their personal lifestyle. On the other side are those who merely carry out repetitive, fragmented tasks, under rigid supervision and control. Unlike traditional paths in other industries, where workers might advance from the shop floor into management, the two information groups are almost completely separate -- bimodal. There are few chances to move up from information handling and assembly to creative professional positions.

Examples of economic "deskilling" are not difficult to find, as technological advances permit automated machinery to perform intricate tasks formerly undertaken by highly trained craftsmen. The danger does exist that society will become increasingly polarized between a small highly skilled elite, whose talents and educational credentials lift them to highly paid positions, and the unskilled, who in part because of the deskilling effects of technology and the increasing neutralization of labor unions may be forced into low-paying and deadend jobs from which they will be unable to advance economically. Under these conditions, the distribution of income within the labor force could worsen in the coming years.

Frank Newman, former president of the University of Rhode Island and current scholar at the Carnegie Foundation for the Advancement of Teaching, however, offers a very different point of view: "as one might expect, the economy is both 'deskilling' and 'skilling' jobs at the same time as the complicated impact of a broad range of technologies takes hold" (1984, p. 6). He points out that professional, technical, and managerial jobs rose from 17 percent of the workforce in 1950 to 27 percent in 1980, and he foresees no change in

this trend. He also foresees the overall educational level of the workforce increasing, rather than decreasing, and opportunities for retraining expanding greatly over the next decade. In addition, he points to the creation of entirely new jobs outside of "high tech" and traditional industry -- such as many in the following list of 50, out of a total of 143 that Norman Feingold (1984, p. 9) has identified as not having existed or being substantially different in character 15 years ago:

Aquaculturist
Arts Manager
Battery Technician
Bionic Medical Technician
CAD/CAM Technician
Certified Alcoholism Counselor
Color Consultant
Community Psychologist
Computer
  Analyst
  Camp Counselor/Owner
  Designer
  Graphics Specialist
  Lawyer
  Microprocessor Technologist
  Sales Trainee
  Security Specialist
Cryologist Technician
Dance Therapist
EDP Auditor
Ethicist
Exotic Welder
Financial Analyst
Forensic Scientist
Genetic Counselor
Graphoanalyst
Hearing Physiologist
Horticulture Therapy Assistant
Housing Rehabilitation Technician
Information Broker
Job Developer
Laser Technician
Market Development Specialist
Medical Sonographer Technician
Mineral Economist
Neutrino Astronomer
Nuclear Medicine Technologist
Ocean Hotel Manager
Ombudsman
PET Scan Technician
Plant Therapist
Power Plan Inspector
Relocation Counselor
Retirement Counselor
Robot
  Engineer
  Salesperson
  Scientist
  Technician (industrial)
  Trainer
Shrimp-Trout Fish Farmer
Software Club Director
Soil Conservationist
Solar Energy Research Scientist
Solar Engineer
Space Mechanic
Sports Psychologist
Systems Analyst
Transplant Coordinator
Underwater Archeologist
Waste Manager
Water Quality Specialist
Wellness Consultant

The increased diversity of employment likely in the future can also be illustrated by the number of new businesses being formed. According to the United States Statistical Abstract, in 1960, 183,000 new industrial and commercial firms were created. In 1981, the number was 582,000 -- or almost 1,600 new companies each day. And even though 1981 saw the middle of America's most severe recession since the Great Depression, the failure rate of firms was not substantially greater that year than in 1960: 61 per 10,000, compared to 57 eleven years earlier.

IMPLICATIONS FOR CALIFORNIA POSTSECONDARY EDUCATION

The prospect of job polarization and "deskilling," as well as the opportunities inherent in California's trend toward an economy increasingly dependent on the production and dissemination of information, have important implications for California's colleges and universities. Three deserve particular attention:

Changes in Educational Technology

In 1964, Marshall McLuhan offered a prescient comment on the educational impact of the change away from the mass production system that has dominated the American economy since the middle of the nineteenth century (p. 316):

> The electric age, by involving all men deeply in one another, will come to reject mechanical solutions. It is more difficult to provide uniqueness and diversity than it is to impose the uniform patterns of mass education; but it is such uniqueness and diversity that can be fostered under electric conditions as never before.

Continuing technological change in society is permitting revolutionary technological change in education. In 1981, the Commission described the electronic opportunities then available to Californians for postsecondary education in its report, Linking Californians for Learning. Over the next 15 years, additional advances in electronics will permit still greater "uniqueness and diversity" of instruction -- not merely for business managers, health specialists, engineers, and other professionals, who today make the most use of new communication media for their continued learning, but also for the home bound, the institution bound, and even the until-now campus bound. Whether or not the polarization of the job market becomes a reality, it is clear that recurrent recourse to education over the course of the adult years will increase and with it the diversity of demands for education. Educational technology will prove important in dealing with this diversity.

Changes in Program and Function

California's economic strength has rested principally on agriculture, heavy industry, and mass production, but the trends now are toward technologically oriented service industries, a change which will make its economic vitality over the next 15 years more dependent on mentality than on muscle -- less on the quantity of physical objects produced than on their efficiency, utility, and ingenuity. Workers in the future will be paid even less than today for their physical strength, compared to their knowledge and skill. In this regard, Dan Dimancescu, coauthor of Global Stakes, argues that the most important role of high technology will not be that of generating employment but instead of making tools. He senses that the United States is currently undergoing a major change in the types of tools it uses to produce wealth. He argues (1984) that unless we stay in the forefront of technology, we will soon find that we are attempting to operate industry with worn-out tools, and that those tools have applications which extend far beyond the technological industries themselves. It is for that reason that those corporations

which are engaged in electronics, lasers, biotechnology, and all the rest need to be encouraged, and also why colleges and universities must continue to stress technological education and research. Very few people will be employed to create, design, produce, and operate the most advanced computers, but unless America devotes large amounts of resources to such activities and produces people who understand them, economic productivity and wealth will be produced elsewhere. And whichever view prevails with respect to the deskilling of the workforce, society's need for postsecondary education is broader than the job market. (Levin and Rumberger, 1983, p. 21.)

As noted in the Commission's recent report, The Wealth of Knowledge, about a third of America's increase in productivity between 1929 and 1969 resulted from "advances in knowledge" (1984c, p. 13), and virtually all of that knowledge was produced directly in university laboratories or indirectly by university graduates in the private or governmental sectors. In the future, when economic growth will be even more heavily dependent on technological advances and skilled workers, higher education's role is very likely to increase in importance, especially in scientific research efforts.

Changes in Institutional Funding and Control

Some observers see the influx of private funds, principally from corporations, as one way to keep both public and private postsecondary education solvent, but it is likely that most of that money will be directed to business, scientific, and technological disciplines as well as to applied research efforts. If this observation is valid, it could accentuate a fundamental difference between higher education and the business community in what they see as education's primary purposes.

Business and education differ in their orientation toward theory and practice. Where institutions of higher education are concerned with teaching fundamental concepts, developing basic analytical skills and theoretical premises, and preserving historical and cultural knowledge, corporate training efforts tend to be vocational, designed to equip individuals with only those skills that are specifically relevant to the sponsoring company's requirements. These corporate efforts currently constitute a $40 billion investment, and most additional funds donated to colleges and universities are designated for academic activities in conformity with corporate expectations of practical results.

The future role and influence of corporate giving in postsecondary education is unclear. Some observers argue that educational institutions will need private funding so much that they will surrender some control over their operations by accepting restrictive conditions on donated funds. Some also fear that consulting and research contracts will seriously compromise faculty independence and objectivity. Taken to its extreme, this view foresees a day when educational institutions will be little more than corporate training facilities. Others do not fear such a dilution or erosion of traditional academic purposes but see the new infusions of money as a means of securing closer involvement with the realities of contemporary economic life. Universities have shown themselves to be extremely resilient institutions; and there are few, if any, indications that their role as the general repository of human wisdom and knowledge will be seriously compromised by private-sector

giving. Academic traditions derive in part from the stability of the faculty and a reverence for tradition. They have deep roots within American culture, and while some change of emphasis may occur in favor of the application of knowledge rather than investigation for its own sake, there does not appear to be any great threat that such a reorientation will crowd out the liberal arts and humanities. What may occur is a perception that closer linkages between the theoretical and the technological are needed in a world where technology is omnipresent but where cultural traditions, historical truths, and moral wisdom are more than ever needed to establish the context for productive living.

CONTINUED ECONOMIC GROWTH

Despite the shifts and possible disruptions in employment patterns precipitated by the trend toward an information-based economy, most economic forecasters believe that America's and California's economies will continue to expand into the 1990s and that most workers then will be at least as prosperous as they are today. Projections to 1989 from the Congressional Budget Office and to 1995 from the U.S. Department of Labor both indicate continuing prosperity. One reason for such optimism is the fact that the current recovery from the 1980-1983 recession is much stronger than originally predicted. When the recovery began at the start of the 1983-84 fiscal year, most forecasters predicted real growth in the Gross National Product of 3 or 4 percent per year adjusted for inflation; but actual growth was 6.2 percent. For calendar 1983, the Congressional Budget Office's prediction for real growth was very close at 6.1 percent, and it forecasts only slightly lower figures for the next two years. Through 1989, it assumes a growth rate of 4.0 percent, which is similar to that of previous postwar recovery periods as shown in Table 3. The U.S. Department of Labor, in carrying its projection out to 1995, offers a more cautious estimate of about 3.0 percent annual growth for the entire period since 1982.

At the same time, some inflation watchers feared that a major economic rebound would once again push increases in the cost-of-living index to double-digit levels. This has not yet occurred. Instead, both the Budget Office and the Research Institute of America -- a private economic and business-forecasting firm based in Washington, D.C. -- now expect inflation to remain near the 5 percent range.

The Congressional Budget Office also estimates that unemployment in 1989 will have declined to 6.5 percent, while the Labor Department projects it at 6.3 percent for 1990 and 6.0 percent for 1995. Any of these unemployment rates would indicate "full employment" by recent standards. For example, although the unemployment rate averaged 4.6 percent for the two decades of the 1950s and '60s, and stood at 4.9 percent in 1969, it averaged 6.9 percent over the 14 years between 1970 and 1983, and rose to 8.5 percent for the past four (1980-1983). Because of technological change, job displacements

TABLE 3 Average Annual Real Growth Rates in the Gross National Product During the Seven-Year Periods Following the Lowest Quarter of Post World War II Recessions

Lowest Quarter	Recovery Rate
Fourth, 1949	4.7%
Second, 1954	3.0
Second, 1958	4.6
First, 1961	5.0
Fourth, 1970	3.6
First, 1975	3.0
Average Recovery	4.0%

Source: Congressional Budget Office, 1984b, p. 7.

will undoubtedly contribute to the unemployment rate for the next several decades, making it extremely unlikely that the unemployment rate will fall below 5 percent before the end of the century.

Since the end of World War II, America has suffered eight recessions -- the six listed in Table 3, the brief 1979 dip and most recently the major downturn between the second quarter of 1980 and the first quarter of 1983. The recessions have occurred at average intervals of 4.7 years with a range between 2.8 and 9.5 years. Given this history, it is reasonable to assume that the nation will experience at least two more recessions before the end of this century. In spite of this likelihood, however, the economy may still be able to achieve average growth of 3 or 4 percent through the year 2000, provided that at least two current problems are solved -- the burgeoning federal deficit, and growing international trade deficits.

CONTROLLING THE FEDERAL DEFICIT

Table 4 shows the amount of annual and cumulative federal deficits for selected years since 1940 and for all years since 1976, together with the Gross National Product and interest payments on the debt. The Congressional Budget Office considers the President's 1984 and 1985 budget deficit estimates of $183.7 and $180.4 billion, respectively, to be conservative and believes the true figures will be closer to $203 and $208 billion, respectively, or some $20 to $30 billion higher. It estimates that, under current federal spending priorities, the federal debt will continue to grow to perhaps as much as $262 billion by 1987.

The concern of economists with continuing large federal deficits is twofold, relating both to the cumulative effect of the amount of interest needed to service the national debt and to pressures for higher interest rates. As Table 4 shows, this year's federal interest obligation as a percentage of the Gross National Product is three times as large as in 1940 and twice as large as in 1966. If the interest obligations on the national debt continue to grow, they will tend to increase future deficits. Continued deficits also increase pressure on interest rates charged to all borrowers. Some of this pressure can be mitigated by capital inflows from other countries, but according to the Congressional Budget Office (1984b, p. 64):

> capital inflows, while adding to the pool of capital, raise the value of the dollar, thereby crowding out export industries and industries that compete with imports. Moreover, the commitments to pay interest and dividends to foreigners become a liability against future U.S. standards of living. To the extent that interest rates rise in spite of these inflows, business capital formation will be less than it would be otherwise, lowering future growth in productivity and living standards.

High interest rates stemming from the large federal deficit also, of course, affect the amortization of the deficit itself, thereby increasing the amount of money necessary to finance it and producing a vicious circle of indebtedness.

TABLE 4 Federal Budget Deficits and Surpluses, Gross National Product, and Interest Payments on the Federal Debt, Selected Fiscal Years from 1940 to 1985, in Billions of Dollars

Fiscal Year	Gross National Product (GNP)	Annual Federal Deficit	Total Cumulative Deficit	Annual Interest Payments	Total Deficit as a Percent of GNP	Interest Payments as a Percent of GNP
1940	$ 100.0	-$ 3.1	$ 50.7	$ 1.0	50.7%	1.0%
1942	158.3	- 20.8	79.2	1.3	50.0	0.8
1944	210.5	- 47.0	204.1	2.5	97.0	1.2
1950	286.2	- 3.1	256.9	5.7	89.8	2.0
1955	399.3	- 3.0	274.4	6.0	68.7	1.5
1960	506.0	+ 0.3	290.9	8.3	57.5	1.6
1962	563.8	- 7.1	303.3	8.3	53.8	1.5
1964	635.7	- 5.9	316.8	9.8	49.8	1.5
1966	753.0	- 3.8	329.5	11.3	43.8	1.5
1968	868.5	- 25.2	369.8	13.8	42.6	1.6
1970	982.4	- 2.8	382.6	18.3	38.9	1.9
1972	1,171.1	- 23.4	437.3	20.6	37.3	1.8
1974	1,412.9	- 4.7	486.2	28.0	34.4	2.0
1976	1,702.2	- 66.4	631.9	34.5	37.1	2.0
TQ[1]	N/A	- 13.0	645.4	7.2	N/A	N/A
1977	1,899.5	- 45.0	709.1	38.0	37.3	2.0
1978[2]	2,127.6	- 48.8	780.4	44.0	36.7	2.1
1979[2]	2,368.8	- 27.7	833.8	52.6	35.2	2.2
1980	2,631.7	- 59.6	914.3	52.5	34.7	2.0
1981	2,954.1	- 57.9	1,003.9	68.7	34.0	2.3
1982	3,073.0	- 110.6	1,147.0	85.0	37.3	2.8
1983[3]	3,309.5	- 195.4	1,381.9	89.8	41.8	2.7
1984[3]	3,651.0	- 183.7	1,591.6	108.2	43.6	3.0
1985[3]	3,995.0	- 180.4	1,828.4	116.1	45.8	2.9

1. Transition quarter, when the start of the federal fiscal year was changed from July 1 to October 1.

2. During the 1970s, the Department of Commerce made some adjustments in the way the Gross National Product is calculated. Thus, the percentages for 1940 through 1979 are calculated on a slightly lower basis than those after 1979.

3. Projections based on figures in the President's budgets.

Sources: 1940-1983: Office of Federal Statistical Policy and Standards, 1980, p. 117; and Council of Economic Advisers, 1984, p. 33. 1984-1985 projections: Congressional Budget Office, 1984a, p. 10.

One alternative is to "monetize" the debt -- to increase the money supply by the simple device of printing more money. Mechanically, this involves a decision by the Federal Reserve Board to increase the amount of money in circulation, an action which forces the Department of the Treasury to print more money. This approach was employed to some degree by the Board in the middle of 1983, but it is clearly inflationary if used extensively. With inflation, interest rates rise and productivity falls, resulting in still another recession. Other alternatives to monetization are increasing taxes or reducing spending, but action on either front will cause hardships of varying severity and uneven application, and could create serious disturbances in the economy, including negating the momentum of the current recovery. Inaction will probably cause inflation to rise, interest rates with it, and a continuing deficit in the trade balance.

At present, virtually all these choices are unsavory, and in an election year it is very unlikely that anything significant will be done. In 1985 and beyond, however, it is clear that hard decisions will have to be made, and the greatest likelihood is that they will be made in a way that will reduce the deficit to about the $100 billion level by 1987. Doing this will involve a combination of reductions in defense spending, curbs on the rapid growth in Social Security payments beyond what has already been reduced by the 98th Congress, cuts in Medicare costs, certain tax actions to reduce or eliminate various tax shelters, and possibly a general tax increase as well. It could even involve a complete restructuring of the tax system, with both the number of brackets and allowable deductions drastically reduced, or even the substitution of a "flat rate" plan -- although few analysts believe such a plan has much chance of passage. Congress may also attempt to capture some of the revenue lost in the underground or "hidden economy," a sector which is already large and almost certainly growing. According to Cheryl Russell (1983, p. 4):

> The underground economy is alive and well. Almost one-quarter of all American households say they earn money that is not normally reported on income tax returns. More than eight of ten American households bought goods and services in this "gray market" in 1981 -- spending fully $42 billion. [This economy] does not include illegal activities such as drug trafficking, prostitution, arson, or illegal gambling.

In all probability, the illegal market is even larger than the legal one. Various commentators have indicated that, in California, the number one cash crop is now marijuana, and the estimates of illegal gambling revenues nationally are consistently in the tens of billions of dollars annually. While the government's revenue losses are undoubtedly significant from legal underground activities that range from roadside stands to home ceramic businesses, to independent construction work, such losses are probably enormous from the illegal trade, even before the social costs resulting from these unlawful enterprises are accounted for.

It is certainly possible that federal deficits will continue to worsen until all of the possible choices will produce negative effects that would result during the 1990s in a major recession, another round of double-digit inflation, or both. Without major changes in spending priorities and the tax struc-

ture -- and even assuming no major defaults on loans by third-world debtor nations -- the most likely scenario involves severe economic stress nationally and, thus, inevitably, in California. The remainder of this paper must assume what is not at all evident: that the federal deficit will be controlled short of a major recession in the next decade. The next several years will show if this assumption is sound.

BALANCING IMPORTS AND EXPORTS

The United States has become inextricably involved in the global economy. In 1950, all American imports and exports totaled only 7.7 percent of its Gross National Product. By 1960, they were still only 8.0 percent. By 1970, they had risen to 10.1, but by 1980 they had doubled to 22.4 percent, and have remained around 20 percent since. Further, in the merchandise sector, the United States enjoyed a surplus in its balance of payments account for the 25 years between 1946 and 1970. But between 1971 and 1983, it incurred deficits for 11 of these 13 years. Exports reached a high in 1980, but have declined by 10.8 percent since. Imports and the balance of trade deficit have continued to increase every year since 1975; and, according to the UCLA Business Forecast, they will continue to do so at least through 1985.

The years 1946, 1982, and 1983 illustrate the extent of this growth both in trade and in America's trade deficit. In 1946, America exported $11.8 billion of merchandise and imported $5.1 billion. That year its foreign investment income and services receipts amounted to $1.8 billion while its payments, excluding military expenditures, came to only $0.2 billion. By contrast, in 1983, merchandise exports reached $200.0 billion and imports $260.6 billion, while in 1982, the services sector produced receipts of $92.0 billion and payments of $58.9 billion. Complete figures for 1983 are not yet available, but a comparison between the first three quarters of 1982 and 1983 shows a 9.5 percent drop in receipts, a 4.8 percent increase in payments, and a $4.6 billion decrease in the investment and services surplus from $25.8 billion to $21.2 billion. Were it not for the income produced by American investments in foreign countries, plus receipts from services rendered, the trade deficit would represent a serious drain on domestic resources, and it now appears that that income is also declining at the same time that the merchandise deficit is increasing (Council of Economic Advisers, 1984).

The current problem of trade deficits stems in part from the fact that since mid-1980, the dollar has appreciated in value by about 50 percent against most currencies in the industrialized world. This has made foreign imports less expensive to Americans and American exports more expensive to foreign nations. In the near future, according to the Congressional Budget Office, America's economic recovery will most likely be stronger than that of most other nations, with the result that its trade balance will become even more unfavorable. The reason: greater domestic prosperity will permit Americans to buy more foreign goods at the same time that slow recovery abroad will continue to depress foreign markets for American products.

Federal budget deficits exacerbate this problem. Continuing large deficits keep interest rates high, causing an inflow of foreign capital. While this flow relieves pressure on domestic credit markets, it also strengthens the dollar and thus expands the trade deficit.

Allowed to continue, the trade imbalance will eventually lower America's standard of living through one or more financial reversals. According to the Congressional Budget Office (1984b, p. 80):

> if interest rates remain high, foreigners may hesitate to continue investing in U.S. assets if massive U.S. trade deficits make them fear a depreciation of the dollar, or if they grow concerned over U.S. fiscal policy. If the inflow of foreign funds were to cease because of such a lack of confidence, substantial upward pressure on domestic interest rates would result, intensifying the crowding out of interest-sensitive domestic expenditures and making it even more difficult for developing countries to service their dollar debts. Another consequence would be a depreciation of the dollar, imparting an inflationary impulse to the American economy.

California commands a prime location for access to Pacific Basin markets, but according to the UCLA Business Forecast as well as the January 1984 issue of California Business, its exports will remain depressed until the nation's trade problems are resolved. And despite predictions that the nation's robust recovery will continue through at least 1986, its trade imbalances will not be corrected until the rest of the industrialized world recovers enough to purchase more American goods. In addition, the dollar will have to weaken relative to other currencies -- but this will not happen until federal deficits are curtailed and interest rates decline.

IMPLICATIONS FOR CALIFORNIA POSTSECONDARY EDUCATION

There is no question that continued expansion of the United States and California economies will increasingly depend on balanced trade, and that important factors in competition for trade will be technological advances, agricultural surpluses, economic stability, and efficient production and transportation systems. America faces great challenges in all of these areas, and it is not at all clear who the winners of the 1990s will be. What is clear is the advantages that academic research and economic literacy can provide in this competition. College and university research has provided the scientific bases for technological advancement; for improvements in communications, transportation, and production; and for a better understanding of economic principles and forces. Postsecondary education has also equipped students with the intellectual and creative skills needed to produce general economic growth, as well as contribute to their own personal productivity. Additionally, it has provided both retraining opportunities for displaced workers and a wider awareness among students of the importance of economic productivity and growth in maintaining and improving living standards, both at home and throughout the world.

INCREASED CONSERVATION OF RESOURCES

In the 1980 Global 2000 Report to the President: Entering the Twenty-First Century, the Council on Environmental Quality and the Department of State warned the President and the American public about the likelihood of severe hardship facing the world by the next century (p. 1):

> If present trends continue, the world in 2000 will be more crowded, more polluted, less stable ecologically, and more vulnerable to disruption than the world we live in now. Serious stresses involving population, resources, and environment are clearly visible ahead. Despite greater material output, the world's people will be poorer in many ways than they are today.

According to the report, the earth may reach its maximum carrying capacity by the end of the twenty-first century, when many essential resources, especially water, are likely to be inadequate to support the number of people then living in many regions of the world. Even before then, Malthusian catastrophes of overpopulation, pestilence, and starvation, may have devastated major parts of the underdeveloped world.

In California, such apocalyptic visions seem distant, but serious environmental problems nevertheless remain. Air pollution continues to be a nagging problem, particularly in southern California. According to the California Air Resources Board, although Statewide levels of ozone concentration decreased by 5 percent between 1973 and 1982, they increased in the San Diego area. Problems also exist with toxic-waste disposal, acid rain, ocean poisoning, and the availability and quality of fresh water. The issue of hunger has little direct effect on California, but its worldwide consequences for California agriculture and for University research could be highly significant in coming years.

Not all environmental analysts are as pessimistic about the future quality of life as the Council on Environmental Quality, at least not in the short run. Among them, Julian L. Simon points out that pollution is not increasing worldwide, but decreasing; that even though the price of energy is increasing and the supply decreasing, conservation is growing even faster; that many increasingly scarce raw materials are being replaced by more efficient and abundant materials, such as the substitution of optical fibers for copper wire or plastics and ceramics for steel and aluminum; that overall food production is up worldwide; and that the world's total amount of arable land actually increased by 16 percent between 1950 and 1970 rather than declining.

Despite such differences among futurists in forecasting the state of the world in coming decades, there is no disagreement that the earth's limited natural resources will need to be better preserved and more wisely used in the future than in the past. Among all discussions of resource conservation, the topic of energy use occupies a prominent place. As noted earlier in this report, when oil was embargoed in the wake of the Arab-Israeli conflict in 1973 and when the Organization of Petroleum Exporting Countries quadrupled the price in 1974, the western industrialized nations and Japan were given a stark reminder that one of the crucial ingredients of their

prosperity rested on a foundation of sand. Subsequent price increases in 1979 were less severe, but they tended to reinforce concern and uncertainty about future supplies of oil and led to reassessments of all sources of energy, both existing and potential.

PRESENT AND PROJECTED SOURCES OF ENERGY

In 1981 -- the latest year for which complete data are available -- 91.9 percent of the energy that America consumed came from fossil fuels (coal, natural gas, and oil), and 3.9 percent more came from nuclear fission. Only 4.2 percent came from non-fossil or renewable resources -- 4.0 percent from hydroelectric power, and less than 0.2 percent from wood- or waste-generated electricity. As Table 5 shows, oil alone accounted for 43.5 percent of all this energy. But as this table also shows, not only did American use of energy in 1981 fall below 1973 consumption levels -- 73.9 quadrillion British thermal units, compared to 74.6 quadrillion earlier -- America's reliance on oil also fell below 1977's percentage of 48.6 and even 1973's level of 46.7 percent.

Much of that reduced reliance on petroleum was undoubtedly caused by the rapid price increases of the 1970s. As noted in Table 1 on page 4, the price of oil increased by 306 percent between 1973 and 1974, and then by another 63 percent between 1979 and 1980. Such dramatic increases surely encouraged reliance on other energy sources, principally coal and nuclear power, and also encouraged major conservation efforts -- including greater reliance on more fuel-efficient vehicles.

TABLE 5 Sources of United States Energy Consumption, by Amount in Quadrillions of British Thermal Units and Percentage, 1973, 1977, and 1981

Source of Energy	Amount Used in Quadrillion (10^{15}) BTUs and in Percentage		
	1973	1977	1981
Coal	23.300 (17.8%)	13.965 (28.3%)	16.039 (21.7%)
Natural Gas	22.512 (30.2)	19 931 (26.1)	19.762 (26.7)
Petroleum	34.840 (46.7)	37.122 (48.6)	32.113 (43.5)
Hydroelectric Power	3.010 (4.0)	2.515 (3.30	2.970 (4.0)
Nuclear Electric Power	0.910 (1.2)	2.702 (3.5)	2.901 (3.9)
Net Imports of Coal Coke[1]	(0.008) (0.0)	0.015 (0.0)	(0.017) 0.0)
Other[2]	0.046 (0.1)	0.082 (011)	0.127 (0.2)
Total	74.609 (100.0)	76.332 (100.0)	73.895 (100.0)

1. Parentheses around amounts indicate that exports were greater than imports.

2. Includes geothermal power and electricity produced from wood and waste.

Source: The World Almanac & Book of Facts, 1983, p. 145.

In 1981, 37.3 percent of all the oil that America used came from foreign sources -- a figure approximately comparable to that in 1975 (37.1 percent) but much reduced from the intervening years of 1976-1980, when it had stayed over 40 percent and reached a high of 47.8 percent. The precarious nature of America's dependence on foreign supplies had a profound effect on political leaders, who took major steps, such as imposing the 55 mile-per-hour speed limit and expanding national oil reserves to make the United States self sufficient in energy. As the California Energy Commission has noted (1984, p. 7):

> For the past decade, petroleum supply has been the dominant national energy uncertainty. The rapid increase in petroleum prices following the supply shortages of the 1973-74 Arab Oil Embargo and 1979 Iranian Crisis had and continue to have heavy economic consequences. In addition, memories of gas lines, the continuing national energy policy debate and the creation of the Strategic Petroleum Reserve all served to underscore the importance of uninterrupted crude oil supplies.

Still, America's position relative to oil supplies is far less tenuous than that of most other industrialized nations, since only about 5 percent of all America's energy needs are derived from Middle Eastern oil fields. If supplies of Middle Eastern oil were cut off altogether, the stoppage would not create direct economic disaster here, but it would have severe effects on America's trading partners and could precipitate a worldwide recession. For example, another energy crisis, perhaps precipitated by an escalation of belligerency between Iran and Iraq, could lead very quickly to loan defaults among third-world nations that would create a ripple effect throughout the industrialized world, including a probable banking crisis domestically, potentially staggering federal deficits, and then a renewal of "stagflation" or worse.

If such catastrophes can be avoided, the most recent forecasts for the years 1990 and 2000 lead the U.S. Department of Energy to conclude that America's energy supplies will be abundant throughout the remainder of the century, and that they will be obtainable at reasonable, though somewhat higher, prices. It also foresees the likelihood that oil and natural gas consumption will be reduced by the end of the century from their 1980 levels, thereby creating even less dependence on foreign petroleum sources than at present. Table 6 contains data from the Department's 1982 Annual Energy Outlook for 1980, and estimates for 2000 from three forecasters. As can be seen, all three projections foresee a trend toward energy self sufficiency and therefore stability, although none of the three foresees total national energy self sufficiency by 2000.

The estimates for 2000 differ in several important respects, especially with regard to America's future reliance on imported oil, with the Energy Department's Office of Policy Planning and Analysis estimating almost six times less dependence on these imports than the firm of Data Resources Incorporated. Nonetheless, they tend to agree on the total amount of energy America will need 15 years from now -- between 93 and 104 quadrillion British thermal units, compared to 78 quadrillion in 1980 -- and the approximate relationship among the various sources. Even with projections that the price of oil will

double in constant dollars by the turn of the century from its current level of about $29 per barrel, the Department foresees that energy efficiency will increase by about 15 to 25 percent, partially offsetting this cost rise. And it attributes the low overall use estimate of 93 quadrillion BTUs by Data Resources Incorporated to "accelerated structural changes in the economy, away from energy-intensive industries and toward communications and services" (p. 106) -- a trend in conformity with that discussed earlier in the chapter entitled "Toward an Information-Based Economy."

Of all the projections in Table 6, those indicating great expansion of nuclear power may be the least certain. All three estimates call for increases in nuclear output over 1980 levels of between 174 and 292 percent -- from nearly a tripling to almost a quadrupling of output by the year 2000. For several reasons, it is extremely unlikely that this will occur. First, current research at the University of California's Lawrence Livermore Laboratory and elsewhere gives no indication that fusion power will make any contribution to America's energy needs within the next 15 years, even though a working prototype may be operational by the end of the century. Second, no fission plant has been ordered in the United States since 1978, while more than 100 orders have been canceled since 1972 (Lovins, 1983, p. 1).

This lack of new orders and cancellations of prior ones are due only in part to continuing fears about, and public opposition to, nuclear energy. Equally, if not more important, is the fact that nuclear plants have become almost prohibitively expensive -- costing about twice as much per kilowatt of electricity produced as coal-fired plants.

California relies far more heavily on petroleum than the nation at large as a source of energy -- for 59.0 percent of its total energy needs in 1980, compared to 43.5 percent nationally in 1981, according to the California Energy Commission (1981, p. 8). It relies on natural gas at about the same rate as the nation at large (31.1 percent, compared to 27.7 percent) but much less on coal (2.4 percent, compared to 21.7 percent) and on nuclear energy (0.8 percent and 3.9 percent, respectively). Given these facts, oil is a major concern for California's future, but the Energy Commission seems confident that supplies will be stable through the remainder of the century, although prices may increase by about 50 percent between 1983 and 2004. According to the Energy Commission, this total increase translates to likely annual increases of 1.0 percent between 1984 and 1989, and then of 2.3 to 2.5 percent thereafter, but the Commission speculates that closure of the Straits of Hormuz would cause gasoline prices in California to increase, at least temporarily, by about 50 percent virtually overnight.

The major imponderable is the future of nuclear power. Four of California's five public utilities for which data are available (excluding the Sacramento Municipal Utility District) have projected substantial increases in nuclear power generation through 2004, undoubtedly due to the expected operations of the San Onofre and Diablo Canyon nuclear plants, but as the Energy Commission notes, not only have all nuclear plants been delayed, but their cost is significantly higher than originally forecast and than other forms of electrical generating facilities (1984, p. 3). A great deal of research is currently being devoted to alternative energy sources, and there is little doubt that some of this research will bear fruit in coming decades.

TABLE 6 Sources of United States Energy Production and Imports in Quadrillions of British Thermal Units, 1980 and Projected 2000

Source of Energy	1980	2000 Projections NEPP[1] Midrange Estimate	2000 Projections ARC[2] Midrange Estimate	2000 Projections DRER[3] Estimate
Domestic Products				
Coal	19.2	41.7	40.5	35.9
Natural Gas	20.1	18.0	17.6	15.5
Oil and Liquified Natural Gas	20.5	17.5	19.8	17.4
Nuclear	2.7	10.6	10.5	7.4
Renewables[4]	5.2	9.7	10.6	4.2
Synthetic Liquids				
Shale	--	2.3	1.7	0.0
Coal-derived[5]	--	(2.3)	(1.5)	(0.3)
Biomass[5]	--	--	(0.8)	--
Synthetic Gas[5]	--	(1.4)	(0.1)	(0.4)
Total Domestic Production[6]	67.7	99.8	100.7	80.9
Net Imports				
Coal and Hydroelectric	- 2.2	- 5.9	- 5.6	- 4.8
Natural Gas	1.0	2.0	0.6	2.8
Oil	13.5	2.5	8.3	14.1
Total Net Imports	12.3	-1.4	3.3	12.1
Adjustments	- 1.9	--	--	--
Total Domestic Supply[6]	78.1	98.4	104.0	92.9

1. National Energy Policy Plan, Energy Projections in the Year 2000. Office of Policy Planning and Analasis; U.S. Department of Energy; Washington, D.C.; July.
2. Annual Report to Congress, Volume 3. Energy Information Administration, U.S. Department of Energy, Washington, D.C., February 1981.
3. Data Resources Energy Review. Data Resources Incorporated, Cambridge, Massachusetts, Autumn 1982.
4. Renewables include such sources as hydroelectric power and wood.
5. Coal-derived, biomass, and synthetic gas are shown for information purposes but are not included in the total. Energy produced by these processes is included in the other fuel categories.
6. Totals do not add exactly due to rounding.

Source: Adapted from Energy Information Administration, 1983, p. 101f.

In the meantime, reliance on existing sources will continue at constantly higher prices, but barring major disruptions, California's energy future until the year 2000 appears to be very stable.

IMPLICATIONS FOR CALIFORNIA POSTSECONDARY EDUCATION

Increased energy costs and limitations on other resources have clear implications for college and university facilities policy in terms of more efficient use of resources, retrofitting for energy conservation, and construction of more energy-efficient buildings. Beyond this, however, questions about the possible contribution of nuclear energy by the year 2000 highlight the problem of limited natural resources and contain a challenge to California's colleges and universities to improve the state of knowledge about energy production and resource conservation. It seems likely that the greatest contribution that California's academic institutions can make to reducing the threat of resource depletion lies in further energy and resource research.

In its Five-Year Outlook on Science and Technology, 1981, the National Science Foundation lists a multitude of problem areas for investigation:

- Improved mineral resource exploration, recovery, processing, and recycling, and better understanding of fundamental mineral formation processes.
- Development of stronger, lighter, and more heat-resistant materials, such as carbon-carbon and metal-matrix composites, to replace strategic metals and alloys.
- Increased knowledge about synthetic fuel production processes and uses, particularly of fermentation of grains and other biomass.
- Regulation of hazardous technologies and contaminants, reduction of emission of airborne carcinogens and of oxides of sulfur and nitrogen from coal use that lead to acid rain, development of bacterial substances to disperse and neutralize toxic wastes, and improved use of industrial wastes.
- Application of semi-conductor materials to photovoltaic systems that convert light directly into electricity.
- Further assessment of the causes and probable long-term effects of pollution in the oceans and of increasing fluorocarbon and carbon dioxide concentrations in the atmosphere.
- Prevention or reversal of the "desertification" of arid lands; rehabilitation of degraded lands; improved management of surface- and groundwater reservoirs; and improvement of technologies for decreasing agricultural, industrial, and urban water use, including development of less water-intensive crops, development of economic uses for naturally occurring arid-land plants, development of crops that can grow in highly saline water, development of economical conversion of seawater and brackish water to potable quality, reduction of the cost of treating polluted water, and improved monitoring of water pollution levels.

- Selective breeding of plants that can grow more rapidly, and absorb and process more nutrients, fix nitrogen from the air, withstand low levels of temperature, nutrients, and water and high levels of acidity, and prove more resistant to pests and parasites.

- Increase worldwide reforestation and improved management of the world's tropical forests.

- Adapting existing and new technology to third-world development needs, including increasing data transmission rates and broadening communication frequency bands of communication satellites to permit their greater use by more countries.

- Further exploration of the uses of space for scientific and economic purposes, and reduction of the costs of data handling from remote-sensing and communication satellites.

Historically, the university has been the home of basic research while other organizations have emphasized applied research with more immediate returns on their investment. Increasing cooperation with industry may expand the role of the university in applied research but should not be allowed to diminish its role as the home of disinterested basic research unmixed with the profit motive. Expanded opportunities for faculty and student research on such issues most likely will require not only institutional cooperation but also additional funds and redirected priorities; but the results in improved well-being of Californians, other Americans, and indeed everyone, could well justify the investment.

AN OLDER, MORE ETHNICALLY DIVERSE, AND LESS HOME-CENTERED CITIZENRY

The most easily identifiable social trend in California is the rapid change in its demographic landscape. Even more than the nation at large, California's population is becoming older and more ethnically diverse. For example, the median age of Californians in 1980 was 29.9 years, but by the year 2000 it is expected to grow to 35.8 -- an almost six-year increase in average age by 2000 (Population Research Unit, California Department of Finance, 1983). In 1980, 10.2 percent of California's population was over 64 years of age, but by 2000, that percentage is expected to climb to 12.3. The number of senior citizens is expected to grow by 1.4 million people, which is likely to form about 19.0 percent of the State's total population growth. A few years into the twenty-first century, the elderly will rapidly become a greater proportion of the population as the baby-boom generation of the 1940s reaches retirement age. The demands that the elderly increasingly will place on public services such as Social Security and Medicare will be substantial and represent one of the principal reasons for so much current concern over the funding adequacy of public health and retirement systems generally.

Even more dramatic is the expected growth in California's Hispanic, Black, and Asian populations. Hispanic and non-white ethnic minorities currently constitute 33.4 percent of the State's population, but according to one study (Center for the Continuing Study of the California Economy, 1982, p. 23) they will comprise between 41.8 and 45.2 percent in 2000 and half the population by 2010 according to another (Hayes-Bautista, Schinck, and Chapa). The numbers of Hispanic Californians will grow particularly fast: for every additional Black resident of the State and every additional three Asian residents, at least six Hispanics will joint the population. Thus, overall by the year 2000, California's already diverse population is expected to include between 3.2 and 4.4 million more Hispanics, 1.5 to 1.6 million more Asians and other races, and from 500,000 to 600,000 additional Blacks.

The implications of these demographic changes for California's colleges and universities will be so great that the Postsecondary Commission will devote another entire paper in its "Prospectus: 1985-2000" series to them. That paper, Population and Enrollment Trends: 1985-2000, will contain projections from the Population Research Bureau of the California Department of Finance and other sources not only regarding the State's changing age and ethnic distribution but also trends in educational attainment, family income, and other demographic characteristics that will affect college-going rates and enrollment levels through the remainder of the century.

As a result, other than identifying several of the implications of these trends at the end of this section, this paper concentrates on social trends that are likely to have equally important implications: changes in California's family structure, mobility, and formation; personal lifestyles; and women's employment.

Americans are among the most transient of peoples and Californians among the most transient of Americans: moving their place of residence more frequently than the populations of 41 other states.

According to the 1980 Census, 46.4 percent of Americans and 55.4 percent of Californians changed residences between 1975 and 1980 (Bureau of the Census, 1984, p. 16). Unless currently unforeseen economic or social factors limit this mobility in the future, there seems little likelihood that these rates will decline, and California's college students in the remainder of the 1980s and throughout the '90s are likely to be increasingly well traveled, cosmopolitan, and varied in geographic background as a result.

Californians are also among the national leaders in the transiency of their family attachments. Nationally, divorce rates more than doubled in the 15 years between 1965 and 1980, and today it is estimated that one out of every two marriages ends in divorce. Although the marriage rate has declined only slightly since 1950 -- 11.1 marriages per 1,000 population in that year, compared to 10.6 in 1980 -- the divorce rate of 2.5 per 1,000 in 1965 rose to 3.5 by 1970, then to 4.8 in 1975, and in 1980 stood at 5.2 (1984, p. 84). In California, there are fewer marriages and more divorces. In 1980, the marriage rate stood at 8.9 per 1,000 population; the divorce rate was 5.8 (Fay, Lipow, and Fay, 1984, p. 2-3). Because of changes in social attitudes, to be discussed in the next section, few observers of the American family predict a reversal in these trends.

Perhaps the most dramatic shift in family life in recent years has involved not the dissolution of marriages, but instead the living arrangments of the never married, as depicted in Table 7. Few displays show so clearly how lifestyles have changed in the United States. Whereas only 9.5 percent of the never-married men and 11.0 percent of the women maintained their own households in 1950, almost five times as many did in 1982. Particularly significant, the increase was greater among women than men: by 1982 more than half of all unmarried women were maintaining their own households, compared to 42.7 percent of unmarried men. Fewer and fewer women were remaining single and living with their parents. Further, between the two alternatives to living with their parents or in someone else's household -- either "living with family members" or "living alone or with nonrelatives," the major increase occurred in the latter category. The percentage of unmarried men maintaining their own households and living alone or with nonrelatives grew even faster than that of women -- by nearly seven times, compared to nearly three times for women. Conversely, the percent of men living with family members actually declined, while that of women increased. Thus in spite of the fact that the marriage rate has not declined significantly, it is clear that marriages are being delayed in favor of "living together" -- an arrangement increasingly popular among young people who either are uninterested in long-term commitments or may feel that the possibility of divorce is now so high that it is better to experiment with "trial marriage" than to risk dissolving a supposedly permanent one. (Thorn. n, and Freedman, 1983).

According to Thornton and Freedman, the trend to independent living, the increased divorce rate, and the tendency to bear children out of wedlock have all combined to produce a social situation where more and more children are being raised in homes without a father present. "If the current prevalence of female-headed families persists," they state (1983, p. 33), "it is estimated that 40 to 50 percent of all children will live in a fatherless family for some time before they reach 18." This trend is especially true

Table 7 Percent of Never-Married Men and Women Aged 25-35 Maintaining Their Own Households in 1950, 1960, 1970, and 1982

Living Arrangement	Men				Women			
	1950	1960	1970	1982	1950	1960	1970	1982
TOTAL MAINTAINING OWN HOUSEHOLD	9.5	19.4	31.1	42.7	11.0	21.1	35.2	53.3
Living with Family Members	4.6	4.3	4.5	4.1	3.6	6.7	11.9	16.8
Living Alone or With Nonrelatives	4.9	15.1	26.6	38.6	7.4	14.4	23.3	36.5

Source: Thornton and Freedman, 1983, p. 31.

among Black households and all households existing below the poverty line, and concern is being expressed not only for the children in such families but also for the mothers, since "single mothers report greater stresses and strains in their lives than do most other people" (ibid.).

An even more visible change in women's traditional roles over the past 30 years than their increased role as head of household has been the employment of married women. In 1949, only 21 percent of married women were in the labor force; by 1982, their percentage had grown to 51. For those mothers with children under six, the increase has been particularly great -- from 11 to 40 percent. According to Thornton and Freedman, a shift in attitudes toward homemaking has accompanied women's greater involvement in economic life (p. 25):

> Traditional attitudes defined the home as the locus for women's work and fulfillment, thereby reinforcing the existing division of labor, but current attitudes support a much broader range of activities for women. Some Americans now expect rather than discourage outside employment for wives. Americans also increasingly believe that women should not only be able to pursue outside interests and careers, but also have equal access to education and good jobs, receive equal pay for equal work, and have the same opportunities as men for political office.

In spite of the defeat of the Equal Rights Amendment, it seems clear that the trend to greater economic participation of women is not slowing to any significant degree. Indeed, the doubling of the divorce rate between 1965 and 1980 forced millions of women onto the labor market in order to support their families, and many married women (parents or not) have come to believe that they can achieve greater personal fulfillment by working at the same time that they assist in elevating the overall standard of living of their families. Their involvement in the workforce has permitted many married couples to send children off to live at college, to travel, and to acquire possessions they would not otherwise have been able to afford, including

homes that could not have been financed with their husbands' income alone. It has also led to the breakdown of traditional discriminatory policies against women, from nepotism rules to business club membership. Where previously most women found that the only road to financial security was through marriage or a "female" occupation such as teaching, nursing, or secretarial work, they now have access to virtually all employment sectors and the prospect of becoming full economic partners with men.

Unfortunately, the differential in wages paid to men and women has not narrowed significantly in the past twelve years. In 1970, men earned an average of 61 percent more per week than women, when both worked full time. In 1982, that gap had narrowed only to 54 percent in spite of the widening influence of affirmative action programs (Bureau of the Census, 1983, p. 434). In all probability, much of this differential can be attributed to job selection and seniority, since many women continue to choose traditionally low-paying "female" occupations and many take time off or also delay entrance to the labor force to bear and raise children, thus reducing seniority-based claims for higher compensation. It is unlikely that the differential will ever be eliminated entirely, but it does appear that opportunities for women are expanding, and will most likely continue to do so.

As other professions have opened up to women, volunteer social service agencies and the traditional women's fields of teaching, librarianship, and social work have had difficulty finding highly qualified personnel. Such professions have paid less than others that required equal educational preparation because women constituted most of their employees. Now that other employment opportunities for women have begun to open up, employers for these "female" occupations are finding that they must pay higher salaries than before; and because many of these professions are financed with public funds, this trend will inevitably increase the strain on public resources.

Changes in women's employment and lifestyle have had repercussions at home, as well. For example, between 1970 and 1980, sales by restaurants of all descriptions increased by 213 percent and sales by fast-food establishments rose 343 percent, compared to only a 112.2 percent increase in inflation and and 11.4 percent growth in population over the same period (Bureau of the Census, 1982, p. 805). More people than ever before are also spending time outside the home in other activities as well -- be it at night-school or continuing education classes, the local health spa, the tennis or racquetball club, spectator sports, or social clubs. Thus since 1960, expenditures for recreational activities have increased by 657 percent, compared to a 307 percent rise in the cost of living (p. 233).

Women's increased employment has been accompanied by an increase in the divorce rate, not necessarily because outside employment has added to their marital dissatisfaction but perhaps because their jobs provide extra resources that can facilitate divorce in unhappy marriages (Thornton and Freedman, 1983, p. 28). Finally, with over half of all married women working outside the home, child care has become big business. In 1958, 56.9 percent of the children of working mothers were cared for either by their fathers or other relatives, but by 1977, that percentage had fallen by nearly one-fourth to 42.8. Group-care centers that supervised only 4.5 percent of the children

of working mothers in 1958 were in charge of 14.6 percent by 1977, while the percentage of these children cared for at home fell from 56.6 to 28.6 percent. This trend toward less contact between mothers and children has prompted some social observers to speculate that among the results may be less beneficial character development, less family cohesion, and reduced social stability (p. 26). Others (Hoffman, p. 136) have suggested that daughters of working mothers may develop more positive self-concept, greater independence, and higher achievement aspirations.

IMPLICATIONS FOR CALIFORNIA HIGHER EDUCATION

Social trends such as those discussed above carry implications for colleges and universities. Among them:

- The aging of California's population points to likely demands both for job-related continuing education and retraining and also for leisure-related general education for mature and retired adults -- in short-term formats, on part-time bases, at such times as evenings and weekends, and in nontraditional, off-campus locations.

- The growth of California's ethnic diversity may produce increased demands for ethnically and culturally specialized programs, and could produce changes in college admissions policies, remedial programs, financial aid opportunities, and academic program requirements to ensure that higher education remains an avenue to success for disadvantaged minorities.

- Changes in women's roles have already had widespread impacts on institutional and departmental enrollments. The Postsecondary Commission's recent report, Major Gains and Losses: Recent Shifts in Popularity of Academic Disciplines as Fields of Concentration (1983b) points to the dramatic shifts that occurred between 1976-77 and 1980-81 in the types of degrees that women earned from California's colleges and universities -- at the bachelor's level, for instance, a jump of 195.5 percent in engineering, 159.1 percent in computer science, 120.2 percent in business and management, 69.8 percent in communications, and even 43.1 percent in agriculture. Conversely, as Table 8 on page 33 shows, their number declined in education and dropped or remained stable in all other academic disciplines with the exception of the physical sciences, where it increased by 23.8 percent. Increased employment opportunities for women throughout the job market are likely to continue or increase these disciplinary choices in the future.

- The concept and definition of a "resident" and the attendant policies regarding user fees could be tested by the mobility of the population and changes in the structure of the home.

TABLE 8 Percentage Changes in the Number of Degrees Awarded to Men and Women in California, 1976-77 Through 1980-81

Discipline	Bachelor's Degrees			Master's Degrees		
	Men	Women	Total	Men	Women	Total
Agriculture	-12.0%	+ 43.1%	+ 6.9%	-25.5%	+ 40.0%	+ 2.0%
Architecture	-17.2	+ 11.5	- 5.4	- 9.5	+107.8	+25.8
Area Studies	-17.6	- 23.1	- 14.3	-37.9	- 14.0	-20.0
Biological Science	-35.7	- 8.6	- 23.0	-20.0	- 12.0	-17.4
Business and Management	+16.5	+120.2	+ 41.8	+12.7	+110.5	+28.4
Communications	- 1.6	+ 69.8	+ 28.5	-13.0	+ 26.0	+ 4.9
Computer Science	+95.8	+159.1	+109.9	+67.0	+ 76.8	+70.8
Education	-24.8	- 2.9	- 13.8	-40.7	- 14.9	-25.6
Engineering	+45.6	+195.5	+ 57.2	- 9.4	+ 55.1	- 5.8
Fine Arts	- 5.0	- 8.7	- 7.1	-10.9	- 0.9	- 6.1
Foreign Languages	-33.2	- 23.1	- 25.7	-20.7	- 14.7	-16.9
Health	0.0	+ 35.3	+ 27.6	+ 8.8	+ 28.2	+22.6
Home Economics	+59.1	- 12.3	- 10.2	+42.9	+ 36.1	+36.8
Letters	-23.6	- 14.6	- 18.4	-26.3	- 16.2	-20.0
Mathematics	-23.7	- 14.5	- 20.4	-41.5	- 44.0	-42.1
Physical Sciences	- 8.7	+ 23.8	- 2.5	+ 7.3	+ 40.8	+12.3
Psychology	-28.3	- 3.1	- 13.6	- 7.8	+ 36.3	+13.3
Public Affairs	-42.0	+ 0.6	- 24.1	-28.0	+ 28.2	- 9.8
Social Science	-32.8	- 14.4	- 25.2	-29.7	- 31.5	-30.3
Interdisciplinary Studies	-25.8	- 10.8	- 15.8	+49.1	+ 51.7	+49.4
TOTAL	-10.4	+ 8.0	- 2.3	- 8.1	+ 3.4	- 3.5

Source: Analytic Studies, California Postsecondary Education Commission.

GROWTH OF IMMEDIACY

Historians, sociologists, novelists, and social critics have long sought to identify the distinctive characteristics of the American mind or temperament, and some of them have looked for particularly prototypical examples in the California character. Among these attitudinal qualities, they have noted distinctive blends of pragmatism, individualism, optimism, egalitarianism, toleration, and an unusual mixture of both violence and humanitarianism. In recent years, some of these writers have pointed to what they consider to be changes in the American mood -- for instance, away from a belief in progress and toward uncertainty, anxiety, and even a feeling of powerlessness about the future, away from "inner-directed" conscience toward "other-directed" conformity, away from a culture of achievement to a culture not merely of narcissism but one of alienation, cynicism, and even nihilism, and away from the traditional Protestant ethic of hard work, delayed gratification and sacrifice, and toward a more hedonistic concern for present happiness.

Such changes in public sentiment are difficult to measure and virtually impossible to predict with any accuracy: Public opinion polls are subject both to methodological bias and temporary fluctuations in individual attitude, and the science of social monitoring is still immature. Yet even if trends in the general character are unpredictable, evidence from individual behavior may give clues to possibly deeper shifts in public consciousness:

- According to the Bureau of the Census, the homicide rate in America more than doubled between 1960 and 1980 -- from 4.7 to 10.7 per 100,000 (1984, p. 180).

- Cases of child neglect and abuse, on which statistics have been available only since 1977, totaled 515,400 that year but 785,100 by 1980 -- a 52 percent increase in only three years (1982, p. 180).

- An estimated 1.8 million children are now reported missing from their families each year (Newsweek, 1984, p. 78).

- Drug use, despite an avalanche of information warning of its dangers, has increased in almost all categories, especially among the young (Bureau of the Census, 1982, p. 123).

- Criminal convictions of corrupt public officials have skyrocketed from 44 in 1970 to 671 in 1982, while evidence of increased public participation in tax evasion has been growing.

- Inpatient and outpatient care in mental health facilities rose from 1.7 million to 6.4 million cases between 1955 and 1979, while the number of doctorates awarded in psychiatry and psychology increased from 954 in 1965 to 3,357 in 1981 (op. cit., pp. 117 and 599).

Even discounting these trends to account for improvements in reporting, they indicate a shift in attitudes.

Thus, on the one hand, American society and California culture are in many ways becoming more open, pluralistic, egalitarian, and individually liberating -- allowing individuals more flexibility in their personal lifestyles and living arrangements, and permitting greater economic and social opportunities to traditionally suppressed groups such as minorities and women. But at the same time, Americans in general and Californians in particular seem to be narrowing their perspective on the future and shortening the range of their commitments. Thus some social commentators see the increased divorce rate as symptomatic of less willingness on the part of marital partners to perpetuate unhappy relationships, while some social workers have come to perceive the growth of child neglect and abuse as a sign of an emerging social attitude toward "disposable children."

In The Emerging Order, Jeremy Rifkin and Ted Howard write of "the demise of the family" and warn of related social trends (1979, p. 202f):

> We live an anonymous existence, our only common bond being the vast consumer fantasyland of indulgencies from which we pick and choose our playthings. Our lives now revolve around the shopping center -- the place where more people spend their leisure hours than anywhere else [except home]. One doesn't need to be a sociologist to understand the social consequences of selfism in contemporary America. Eliminating personal responsibility from the concept of individualism has produced . . . a society of . . . hedonists.

Other critics increasingly see the problems of the schools, such as declining test scores, as less an indictment of poor teachers than of poor parents. Thus former presidential assistant Jody Powell reports (1983):

> It is impossible to talk for long with those who are trying to teach without coming to the conclusion that the schools are not educating our children in large measure because parents are doing an increasingly lousy job of raising them. . . . A good part of the problem seems to be the idea that nothing, including children, ought to be much of a bother, that careers and lifestyles should proceed unaltered by the arrival of a child. It has never been that way, and now, when careers and lifestyles more than ever conflict with the responsibilities of parenting, the attitude is more prevalent than ever.

Still other observers look for culprits beyond parents to the wider society. Thus as early as 1970, the White House Conference on Children, in its report to then President Nixon, stated, "In today's world parents find themselves at the mercy of a society which imposes pressures and priorities that allow neither time nor place for meaningful activities and relations between children and adults." And more recently, Urie Bronfenbrenner, chairman of the Department of Human Development and Family Studies at Cornell, similarly placed much of the blame on the nature of modern society -- the commuting, the demands of a job or two jobs to make ends meet, the overtime and extra assignments to get ahead, and the social and community obligations in the evenings and on weekends. All of these forces, he argued, leave children in the hands of passive babysitters, often an electronic one (1975, p. 28):

> The primary danger of the television screen lies not so much in the behavior it produces as the behavior it prevents -- the talks, the games, the family festivities and arguments through which much of the child's learning takes place and his character is formed. Turning on the television set can turn off the process that transforms children into people.

Certainly television -- the dominant electronic medium of the new information age -- has become ubiquitous. In 1950, television sets could be found in only 9 percent of American households, compared to 98 percent in 1982, with 71.4 percent having color sets. The number of television stations expanded from 107 in 1950 to 725 in 1980, and cable television grew from serving only one in every 10,000 Americans in 1952, to one in every five today (Bureau of the Census, 1982, p. 555).

Neil Postman, professor of education in the Department of Communication Arts and Sciences at New York University, notes that by the time most young people reach 18, they have watched an average of 21,000 hours of television yet they have been in school for only 13,000 hours. He concludes that American society is rapidly shifting from "a culture organized around typography to a culture based on the electronic image," and he warns that television is a curriculum in its own right which embodies its own philosophy (1983, p. 314).

> Its axioms include that history is bunk, that hierarchies are arbitrary, that problems have no antecedents, that the future is not worth dwelling upon, that randomness is uncontrollable. I believe the word for these beliefs in philosophical discourse is nihilism.
>
> As I see it, the teachings of television are hostile to language and language development, hostile to vigorous intellectual activity, hostile to both science and history, hostile to social order, and hostile in a general way to conceptualization. Television is a curriculum that stresses instancy, not constancy; discontinuity, not coherence; immediate, not deferred, gratification; emotional not intellectual, response.

Clearly a trend toward instant gratification is not merely the product of television. Many facets of contemporary life contribute to it, from the lure of advertising to the threat of nuclear war, a resurgence of apocalyptic thought, uncertainty about the hereafter, and electronic technology of which television is only one example. "We are becoming the servants in thought, as in action," John Kenneth Galbraith has observed, "of the machines we have created to serve us" (1967, p. 4); and even computers seem to contribute to society's drift toward immediacy, for they place a premium on instancy of result and on shortening the distance between input and output, with a consequent deemphasis of the virtues of investment, reflection, and detached observation.

IMPLICATIONS FOR CALIFORNIA POSTSECONDARY EDUCATION

In the schools, these attitudinal trends have a parallel both in demands for "relevance" and in the "basic skills" movement that emphasizes concrete and employable competence in preference to education for higher levels of analysis and synthesis. In higher education, these trends lead to similar vocationalism. In every one of the disciplinary changes between 1976-77 and 1980-81 that the Commission reported in Major Gains and Losses (1983), the degree programs that gained ground were essentially occupational -- each designed to provide graduates with specific skills in specific areas that would be immediately marketable. Conversely, the areas which lost the most graduates were generally characterized as fields in which the education acquired was less specific and less marketable. As Table 7 earlier showed, the disciplines that showed the greatest growth at the bachelor's-degree level, on a percentage basis, were computer science, engineering, business and management, and health. Those that lost the most ground were foreign languages, social science, and public affairs. At the master's-degree level, the leaders were computer science, interdisciplinary studies, home economics, business and management, and architecture. Declines were experienced in mathematics, social science, education, letters, and area studies. And even though, as noted before, the number of women entering both business and technological fields is increasing rapidly, men's interest in the liberal arts appears to be declining even more rapidly than women's.

In another report, One World in Common; General Education in Historical, National, and Statewide Context, the Commission noted that California's colleges and universities "have traditionally included general education as part of the curriculum, but in all segments, general education has been eclipsed by specialization and has become increasingly neglected and fragmented" (1981b, p. 13). Although institutional officials are attempting to reverse this trend, little evidence exists that their efforts are in any significant way countering the drift toward vocationalism or sparking a resurgence of the liberal arts and humanities.

The trend toward vocationalism is understandable as a response to the current importance society attaches to productive employment and in view of increased enrollment of first-generation college students who may be reluctant to invest in a degree program that has few prospects of leading to immediate employment. However, the long-term effects on society and its institutions, may not be beneficial. Higher education's purposes have long included a commitment to ideas, the transmission of the cultural heritage; the development of personal discipline and moral responsibility, and the integration of literature, the arts, and the sciences into a coherent curriculum that encourages the use of reason, understanding, and objectivity. The recent trend toward job-specific training appears as a cross-current to that mainstream.

PRESSURES ON POSTSECONDARY EDUCATION

In the next fifteen years, colleges and universities can expect external pressures to mount -- pressures to produce the engineers, computer scientists, technicians, and business administrators to run the information society; pressures to contribute to general economic prosperity; pressures to solve environmental problems; to adjust to demographic and lifestyle changes; in short, respond to demands for immediate results. In addition, according to the Carnegie Council on Policy Studies in Higher Education, higher education can expect more regulation by governmental agencies of both public and private institutions, more pressure to serve the student "market," and more dependence on public sources of financial support.

In the Council's final report on the future of American colleges and universities, Three Thousand Futures: The Next Twenty Years for Higher Education (1981), it forecast other changes associated with these pressures:

- Slowing and uncertain rates of enrollment growth;
- Increasing concentration of students in public institutions and on large campuses of traditional form;
- An aging faculty and loss of institutional dynamism and flexibility; and
- More defensive internal reactions to external constraints.

Specifically concerning the student body, the Council remarked (p. 53):

> In 1960 it was composed predominantly of young majority males attending full time. By 2000 there will be more women than men, as many people over 21 as 21 and under, nearly as many part-time as full-time attendees, and one-quarter of all students will be minorities. Roughly one-half of the students in the classroom of 2000 would not have been there if the composition of 1960 had been continued. This is a fundamental, almost radical change in higher education.
>
> We expect that students will be more nearly the center of attention on campus during the next 20 years than in the past 10. They will be recruited more actively, admitted more readily, retained more assiduously, counseled more attentively, graded more considerately, financed more adequately, taught more conscientiously, placed in jobs more insistently, and the curriculum will be more tailored to their tastes.

The Council expressed concern that the competition for students will "lead to a decline in academic quality, in integrity of conduct, in the balance among the many intellectual fields that constitute the university of knowledge" and that institutional diversity will succumb to government's heavy hand and to market pressures for conformity. It believes that the declining pool of students will lead to a "shakeout" within higher education of particularly vulnerable institutions -- among them, the least selective liberal

arts colleges and private two-year colleges. It foresees that as part of society's drive for technological advance, students will gravitate to institutions which they believe offer quality academic specialization and career preparation, since that quality will enhance their employability and advancement prospects. Some will move to proprietary schools that offer the promise of training in marketable skills and job placement, but otherwise they will tend to shy away from high-tuition institutions. Since the growth in tuition among private and independent colleges and universities has far outstripped the rise in the cost of living, many of them will be hurt unless there is a substantial influx of student-aid funds. On all these counts, independent colleges, especially those which are less selective and which offer instruction only in the liberal arts, will be hit very hard; some will probably be forced to close their doors.

The same concern applies to public colleges and universities that are not research oriented and have lower admission requirements than those of the most highly rated universities. Because these public colleges are often perceived as having lower quality and therefore less utility on the economic market, their enrollments will probably decline as the total pool of students drops over the next five to ten years.

In all probability, however, public community colleges have the potential for further growth. Their fees may rise, but these fees will still be so much less than those at four-year institutions that community college education will remain a bargain. Moreover, their diversity of offerings has made them the educational supermarkets of modern society, providing a wide array of occupational, academic, and community service programs, and allowing them to serve as a conduit to four-year institutions. As the Carnegie Council noted (p. 58), "their approaches fit the new styles of many young people: easy-in, easy-out; part-time studies; low levels of pressure; vocational and recreational courses; opportunities to live at home or in a noncollegiate community; great leeway for individual patterns of behavior." Selective liberal arts colleges will survive because of their high prestige and quality, because they will continue to serve as feeder institutions to the best graduate schools, because they have strong endowments and alumni support, because they will draw students from those liberal arts colleges which fail, and because a large enough pool of students with an interest in general education will remain in spite of the drive to vocationalism, to keep their enrollments high.

Finally, the major research universities will do very well because they serve so many different clienteles, perform so many different functions, have such high visibility and renown, and at the same time have admission requirements that could be lowered, if necessary, to attract additional students. Public institutions of this type, such as the University of California, will be especially strong, in part because of their more secure funding bases, in part because they will benefit from further tuition increases at independent institutions, and finally because they will be able to draw students from other public colleges and universities. The recent experience of the University of California, where admission applications are the highest in history, may be a first example of this trend. Nevertheless, even research universities will need to make significant internal adjustments as students continue to shy away from the liberal arts and humanities and toward business and technological disciplines. In particular, their doctorate

programs in the former disciplines will have difficulty recruiting students, while those in the latter will have problems recruiting qualified faculty.

The California Postsecondary Education Commission generally agrees with the Carnegie Council concerning these likely trends in postsecondary education, but it notes that many of these trends have been evident in California for some time, though it is encouraging to see renewed emphasis on competency both in the schools and in postsecondary education. Certainly, in this State, the Council's comments on the community colleges are closer to history than prophecy, and the recent differences in the application rate between the University of California and the California State University may indicate that California is once again something of a bellweather for America at large.

In the previous pages, the Commission has identified several significant economic trends that are affecting California postsecondary education. a change from an economy based on heavy industry and standardized production to one based on sophisticated information technology, product diversity, and services; continued economic prosperity at modest growth rates; and a continuing supply, although at escalating prices, of energy. These and other economic trends have altered America's social milieu in the direction of increasingly open lifestyles; less permanent family associations; relaxed moral strictures; greater personal anxiety, rootlessness, and criminality; and a desire for instant gratification and sensory intensity. All of these trends plus current demographic changes are affecting postsecondary education in the form of greater vocationalism, greater corporate involvement, increased emphasis on business and technology, a de-emphasis on the liberal arts and humanities, a sifting out of weaker institutional types, internal shifts among favored and neglected disciplines, more open and flexible academic scheduling, a larger number of transient students taking part-time programs in the evening and on weekends, more sensitivity to student choices, and the relative growth of the public sector at the expense of private and independent institutions.

In all these tendencies the element of uncertainty appears constantly -- so much so that the Commission has published a paper by Frank M. Bowen and Lyman A. Glenny devoted to that subject alone (1980). Uncertainty is a given in the latter stages of the twentieth century, for circumstances are changing so much faster than in previous decades. Thus few, if any, of the trends discussed here will be immune from alteration, and it is impossible to find a consensus among economists and social observers on which of them are beneficial or detrimental. Some analysts see a society emerging that is more sensitive to human needs, while others anticipate threats and dangers ranging from cultural decadence to nuclear holocaust.

In such a context, a balanced viewpoint is essential, however elusive. The world may be a more dangerous place in the mid-1980s than it has ever been before, principally due to the proliferation of weaponry and the instability of an increasingly intricate and sensitive international economy, but it has never been altogether safe and secure. In the 1990s, all that can be predicted is that surprises and challenges will come, adjustments will be made, crises will be accommodated, life will go on. If it is true, as Heraclitus observed, that nothing endures but change, then it is also true that humanity has endured in spite of change, and probably will continue to endure all

changes imposed by either people or providence. Any speculations on destiny, though, should engender a respect for heritage, a respect for those who dealt with and conquered the uncertainties, disruptions, and alterations of their own times that, to them, must have seemed as formidable as those of today. Colleges and universities have monitored these changes over the centuries, and thus continue to act as both the repository of the wisdom gained from them and the designer of new solutions to new dilemmas. If higher education has always been changed by the forces that swirl around it, it has also been a principal agent for change and for adaptation to change; and whatever happens in the future that role will continue.

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REFERENCES

Botkin, James; Dimancescu, Dan; and Stata, Ray. Global Stakes: The Future of High Technology in America. Cambridge, Mass.: Ballinger, 1982.

Bowen, Frank M., and Glenny, Lyman A. Uncertainty in Public Higher Education: Responses to Stress at Ten California Colleges and Universities. Sacramento: California Postsecondary Education Commission, January 1980.

Bronfenbrenner, Urie. "The Next Generation of Americans." Paper presented to the annual meeting of the American Association of Advertising Agencies, March 19-22, 1975.

Bureau of the Census, U.S. Department of Commerce. Statistical Abstract of the United States: 1982-83. 103rd Edition. Washington, D.C.: U.S. Government Printing Office, December 1982.

--. Statistical Abstract of the United States, 1984. 104th Edition. Washington, D.C.: Government Printing Office, 1983.

Bureau of Labor Statistics, U.S. Department of Labor. Monthly Labor Review. 106:11 (November 1983).

California Energy Commission. Annual Energy Production and Consumption, 1980. Sacramento: The Commission, September 1981.

--. Preliminary Energy Commission Staff Price Forecast for California Utilities. Sacramento: The Commission, March 1984.

--. Annual Petroleum Review. Sacramento: The Commission, April 1984.

California Postsecondary Education Commission. Linking Californians for Learning: Next Steps for Telecommunications in California Postsecondary Education. Commission Report 81-28. Sacramento: The Commission, November 1981a.

--. One World in Common: General Education in Historical, National and Statewide Context. Commission Report 81-27. Sacramento: The Commission, November 1981b.

--. Major Gains and Losses: Recent Shifts in Popularity of Academic Disciplines as Fields of Concentration. Commission Report 83-25. Sacramento: The Commission, June 20, 1983.

--. A Prospectus for California Postsecondary Education: 1985-2000. Commission Report 84-6. Sacramento: The Commission, January 1984a.

--. A Review of Statewide Long-Range Planning: One in a Series of Background Papers for the Commission's Long-Range Planning Project, A Prospectus for California Postsecondary Education, 1985-2000. Commission Report 84-17. Sacramento: The Commission, April 1984b.

--. The Wealth of Knowledge: Higher Education's Impact on California's Economy. Commission Report 84-1. Sacramento: The Commission, January 1984.

California State Department of Finance. Population Projections for California Counties. Finance Report No. 83-P-3. Sacramento: The Department, 1983.

"California's 1984 Industry Outlook," California Business, January 1984, p. 40ff.

Carnegie Council on Policy Studies in Higher Education. Three Thousand Futures: The Next Twenty Years for Higher Education. San Francisco: Jossey-Bass, 1981.

Center for the Continuing Study of the California Economy. Projections of Hispanic Population for California, 1985 - 2000. Palo Alto: The Center, 1982.

Congressional Budget Office. The Industrial Policy Debate. Washington, D.C.: U.S. Government Printing Office, December 1983.

--. Baseline Budget Projections for Fiscal Years 1985 - 1989: A Report to the Senate and House Committees on the Budget, Part II. Washington, D.C.: U.S. Government Printing Office, February 1984a.

--. The Economic Outlook: A Report to the Senate and House Committees on the Budget, Part I. Washington, D.C.: U.S. Government Printing Office, February 1984b.

Council of Economic Advisors. Economic Indicators, February 1984. Washington, D.C.: U.S. Government Printing Office, 1984.

Council on Environmental Quality, and the U.S. Department of State. The Global 2000 Report to the President. Washington, D.C.: U.S. Government Printing Office, 1980.

Cronin, Beverly. Book Review of Global Stakes: The Future of High Technology in America. Popular Computing. October 1983, p. 258ff.

Energy Information Administration, U.S. Department of Energy. 1982 Energy Outlook, With Projections to 1990. Washington, D.C.: U.S. Government Printing Office, April 1983.

--. 1982 Energy Outlook Supplement. Washington, D.C.: U.S. Government Printing Office, April 1983.

Enzer, Selwyn. "New Directions in Futures Methodology," in Renfro, William L.; Morrison, James L.; and Boucher, Wayne I., eds., Applying Methods and Techniques of Futures Research: New Directions for Institutional Research 39. San Francisco: Jossey-Bass, September 1983.

Fay, James S.; Lipow, Anne G.; and Fay, Stephanie, W. California Almanac, 1984-85. Novato, CA: Presidio Press and Pacific Data Resources, 1984.

Feingold, S. Norman. "Emerging Careers: Occupations for Post-Industrial Society." The Futurist, 18:1 (February 1984) 9-16.

Fullerton, H. N., and Tschetter, J. "The 1995 Labor Force: A Second Look." Monthly Labor Review, 106:11 (November 1983).

Galbraith, John Kenneth. The New Industrial State. Boston: Houghton Mifflin, 1967.

Gelman, David; Agrest, Susan; and others. "Stolen Children." Newsweek, 103:12 (March 19, 1984) 78ff.

Hawkin, Paul. The Next Economy. New York: Holt, Reinhart, and Winston, 1983.

Haves-Bautista, David E.; Schinck, Werner O.; and Chapa, Jorge. "The Young Latino Population in an Aging American Society: Policy Issues in the Emergence of an Age-Race Stratified Society." Unpublished paper, n.d.

Hoy, John C., and Bernstein, Melvin H. Financing Higher Education: The Public Investment. Hanover, N.H.: University Press of New England, 1981.

Hoffman, Lois Wladis, and Nye, F. Ivan. Working Mother: San Francisco: Jossey-Bass, 1974.

Kahn, Herman. The Year 2000: A Framework for Speculation on the Next Thirty-Three Years. New York: MacMillan, 1967.

Kuttner, Bob. "The Declining Middle." The Atlantic Monthly, 252:1 (July 1983) 60-72.

Levin, Henry. "Planning for Higher Education and Jobs in an Age of High Technology." Remarks prepared for the 1984 Indiana Governor's Conference for University Trustees on the Role of Higher Education in Indiana's Economy, January 12, 1984.

Levin, Henry and Rumberger, Russell. "The Low-Skill Future of High Technology, Technology Review LXXXVI August/September 1983, pp. 18-21.

Lovins, Amory, and L. Hunter. "How Secure is Energy in the U.S." Sacramento Bee "Forum," November 20, 1983, p. 1.

McLuhan, Marshall. Understanding Media. New York: McGraw-Hill, 1964.

Naisbett, John. Megatrends. New York: Warner Books, 1982.

National Science Foundation. "Executive Summary." The Five-Year Outlook on Science and Technology, 1981. Washington, D.C.: Government Printing Office, 1982, pp. ix-xxii.

Newman, Frank. "Higher Education in an Age of Higher Technology." Remarks prepared for the 1984 Indiana Governor's Conference for University Trustees on the Role of Higher Education in Indiana's Economy, January 12, 1984.

Office of Federal Statistical Policy and Standards, U.S. Department of Commerce, and the Council of Economic Advisers. 1980 Supplement to Economic Indicators: Historical and Descriptive Background. Washington, D.C.: U.S. Government Printing Office, 1980.

Population Research Unit, California Department of Finance. Population Projections for California Counties, 1980-2000. Report 83-P-3. Sacramento: The Department, 1983.

Postman, Neil. "Engaging Students in the Great Conversation." Phi Delta Kappan. 65:5 (January 1983) 310-316.

Powell, Jody. "Bad Education Can be Blamed on Shiftless, Selfish, Indulgent Parents." Los Angeles Times, November 22, 1983.

Reich, Robert B. The Next American Frontier. New York: Times Books, 1983.

Report to the President: White House Conference on Children. Washington, D.C.: U.S. Government Printing Office, 1970, p. 240-255.

Rifkin, Jeremy, and Howard, Ted. The Emerging Order: God in the Age of Scarcity. New York: G. P. Putnam's Sons, 1979.

Rumberger, Russell W. "Overeducation: The Growing Imbalance Between Education and Work." IFG Policy Notes (Institute for Research on Educational Finance and Governance, Stanford University), Summer 1981, 3f.

Russell, Cheryl. "Underground Economy." American Demographics, 5:10 (October 1983) 4ff.

Schement, Jorge Reina; Lievrouw, Leah A.; and Dordick, Herbert S. "The Information Society in California: Social Factors Influencing its Emergence." Telecommunications Policy, March 1983.

Silvestri, George T., and others. "Occupational Employment Projections Through 1995." Monthly Labor Review, 106:11 (November 1983).

Simon, Julian L. "Global Confusion 1980: A Hard Look at the Global 2000 Report." The Public Interest, 61 (Fall 1980) 3-20.

"Sleepwalking Through Life." Editorial, The Sacramento Bee, October 3, 1983.

Thornton, Arland, and Freedman, Deborah. "The Changing American Family." Population Bulletin. 38:4 (October 1983) 36-37.

Toffler, Alvin. The Third Wave. New York: William W. Morrow, 1980.

University of California at Los Angeles Graduate School of Management. The UCLA Business Forecast. Los Angeles: The School, December 1983.

The World Almanac & Book of Facts, 1983. New York: Newspaper Enterprise Association, 1981.